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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/541,032	04/21/2006	Isao Nishimura	21024/65527	4015

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EXAMINER

JOHNSON, CONNIE P

ART UNIT	PAPER NUMBER
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1795

NOTIFICATION DATE	DELIVERY MODE
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10/22/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/541,032

Applicant(s)

NISHIMURA ET AL.

Examiner

CONNIE P. JOHNSON

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 October 2009.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,6-10,12-14 and 21 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1,3,6-10,12-14 and 21 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/S508)
Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. The remarks and amendment filed 10/5/2009 have been entered and fully considered.
2. Prosecution is reopened because the claim amendments were not considered in the final rejection issued on 5/5/2009. However, the action remains under final rejection.
3. Claims 1, 3, 6-10, 12-14 and 21 are presented.
4. Claims 1, 6, 7 and 14 are amended.
5. Claim 21 is new.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 6-8, 12, 14 and 21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 21 is drawn to "the method of claim 1, wherein the resin is polymerized with a living radical polymerization initiator." However, claim 1 is drawn to a radiation-sensitive composition. It is unclear if applicant is claiming a composition comprising the living radical polymerization initiator or a method of making the composition. Claims 6-8, 12 and 14 are dependent upon claim 21 and are also rejected.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1, 3, 6-10 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maeda et al., U.S. Patent Publication No. 2001/0026901 A1.

Maeda teaches a photoresist composition comprising a polymer and a photoacid generator. The polymer comprises a recurring group as in formula (2) of Maeda on page 2. The recurring group comprises an alicyclic group with a lactone structure. The polymer also comprises a second recurring group attached. Maeda shows the second recurring group as R₄ in formula (2) (page 15, formula (2), wherein R⁴ is an alicyclic hydrocarbon having 7 to 13 carbons atoms with an acid-labile group wherein the acid-labile group is t-butyl (page 15, [claim 3] and page 3, [0031]). The t-butyl group is an alkyl of 1 to 4 carbons as the R² substituent with the alicyclic hydrocarbon in the present invention. The second recurring unit in Maeda meets the limitations of instant claim 1,

formula (1). Example 10 shows the second recurring unit in an amount of 30mol% ($y=0.3$), which is representative of formula (I) of instant claim 1 (page 9). The polymer has a ratio of weight average molecular weight to a number average molecular weight of 1.45, 1.4 and 1.5, respectively. Although not exemplified, polymerizing two or more different monomer units, in the presence of a radical polymerization initiator is capable of forming a random copolymer. Maeda also teaches a triphenylsulfonium salt compound as the photoacid generator in the composition (page 7, [0044]) and an organic base compound, such as N,N-dimethylaniline, which is capable of diffusing acid (page 8, [0054]). The difference between the present application and the prior art is that Maeda does not teach the ratio of weight average molecular weight to a number average molecular weight is 1.0 to 1.3. However, as shown above, the reference does teach 1.4 which is extremely close in range and the result would be expected to be the same, absent any evidence to the contrary.

"A prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. Titanium Metals Corp. of America v. Banner, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985)" (MPEP 2144.05). Therefore, it would have been obvious to one of ordinary skill in the art that the polymer of Maeda comprising a recurring unit of formula (2) would be expected to have the same properties and perform in the same manner as the presently claimed polymer.

10. Claims 6, 8 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maeda et al., U.S. Patent Publication No. 2001/0026901 A1 in view of Matyjaszewski et al., WO 96/30421.

Maeda teaches a radiation-sensitive composition comprising an acid-decomposing resin, a photoacid generator and a radical polymerization initiator. Maeda does not teach that the composition comprises a living radical polymerization initiator.

Additionally, Matyjaszewski teaches atom transfer radical polymerization (ATRP), which is a form of living polymerization, to form random polymers (page 33, lines 23-24 and page 36, lines 10-20). ATRP comprises polymerizing monomers in the presence of an initiator having a radically transferable atom or group, a transition metal compound and a ligand to form a copolymer (page 8, lines 19-26 and page 9, lines 1-11) (claim 6). Reverse ATRP is also conducted using a polymerization initiator, such as azobis(isobutyronitrile) (AIBN), which is a heat radical generator (page 30, lines 20-25) (claims 8 and 12). ATRP produces random copolymers with a polymer dispersity of 1.10 or less insuring greater uniformity in copolymer properties (page 42, lines 15-20).

Matyjaszewski also teaches that in conventional free radical polymerization, initiation is incomplete due to slow decomposition of the radical initiator, which yields polymers with unpredictable weight, broader molecular weight distribution and uncontrolled structures (page 67, lines 1-9). Maeda uses conventional radical polymerization to form the acid-decomposing polymer wherein the polydispersity ranges from 1.4 to 2.13 and would therefore benefit from a living radical polymerization initiator. Therefore, it would have been obvious to one of ordinary skill in the art to use a

living radical polymerization initiator in the composition of Maeda to form a polymer with a controlled structure and a narrow polymer dispersity value.

11. Claims 7, 12 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maeda et al., U.S. Patent Publication No. 2001/0026901 A1 in view of Matyjaszewski et al., WO 96/30421 and further in view of Le et al., WO 98/01478.

Maeda teaches a radiation-sensitive composition comprising an acid-decomposing resin, a photoacid generator and a living radical polymerization initiator comprising a transition metal complex, an initiator with a radically transferable atom or group and a ligand to form a copolymer as relied upon above. Maeda does not teach that the ligand comprises a structure as in formula (8) of claim 7.

Additionally, Le teaches a composition comprising polymerizable monomers, a living radical polymerization initiator and a transfer agent. The composition forms polymers with a low polydispersity of less than 1.1 (page 18, lines 10-11). The transfer agent comprises compounds, such as



wherein formulas (14) and (15) are representative of formula (8) of instant claim 7 when Y is a single bond, R' is an aryl group, R'' is an alkyl with 1-15 carbons (page 25). Le teaches the transfer agents are used to form a polymer with a low dispersity. Therefore, it would have been obvious to use the transfer agents (14) or (15) of Le in the

composition of Maeda with reasonable expectation of forming a polymer with a dispersity index of less than 1.1.

12. Claims 14 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maeda et al., U.S. Patent Publication No. 2001/0026901 A1 in view of Matyjaszewski et al., WO 96/30421 and further in view of Gennady et al., July 2001.

Maeda teaches a radiation-sensitive composition comprising an acid-decomposing resin, a photoacid generator and a living radical polymerization initiator comprising a transition metal complex, an initiator with a radically transferable atom or group and a ligand to form a copolymer as relied upon above. Maeda does not teach the composition has an alkoxyamide compound as in claim 14.

Additionally, Gennady teaches that living radical polymerizations mediated by nitroxides form polymers with low polydispersity values. The nitroxides include compounds with structures of TEMPO-Pest and TEMPO-EEst on page 3605. Although the TEMPO-Pest and TEMPO-EEst compounds have a $C(CH_3)_3$ group instead of a CH_3 group attached to the oxygen, the compounds would still function to initiate polymerization the same as when the CH_3 group is the substituent. Therefore, it would have been obvious to one of ordinary skill in the art to use the TEMPO-Pest or TEMPO-EEst compound of Gennady in the composition of Maeda to further improve the polymer dispersity.

Response to Arguments

13. Applicant's arguments, filed 10/5/2009 with respect to the rejection(s) of claim(s) 1-3, 6-9 and 12-14 under 103(a) and claims 1-14 under 103(a) have been fully

considered and are persuasive. Therefore, the rejections have been withdrawn. However, upon further consideration, new ground(s) of rejection are made herein.

14. Applicant argues that Maeda does not teach that the recurring unit that is representative of formula (I) of claim 1 is present in an amount of 15-70mol%.

Example 10 in Maeda shows the second recurring unit in an amount of 30mol% ($y=0.3$), which is representative of formula (I) of instant claim 1 (page 9).

Conclusion

15. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CONNIE P. JOHNSON whose telephone number is (571)272-7758. The examiner can normally be reached on 7:30am-4:00pm Monday thru Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Connie P. Johnson/
Examiner, Art Unit 1795

/Cynthia H Kelly/

Supervisory Patent Examiner, Art Unit 1795